The opinion in support of the decision being entered today was ***not*** written for publication and is ***not*** binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte HIDEO YAMANAKA
and KIKUO KAISE

Appeal No. 2005-0965
Application 09/646,680

HEARD: July 14, 2005

Before WARREN, KRATZ and TIMM, *Administrative Patent Judges.*

WARREN, *Administrative Patent Judge.*

Decision on Appeal and Opinion

We have carefully considered the record in this appeal under 35 U.S.C. § 134, including the opposing views of the examiner and appellants, and based on our review, find that we cannot affirm the grounds of rejections advanced on appeal: claims 1, 2, 16, 17 and 20 stand rejected under 35 U.S.C. § 102(b) as anticipated by Desphandey et al. (Desphandey) (answer, pages 3-4); claim 14 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Desphandey as applied to claim 1, and further in view of Doi (*id.*, page 4); claims 8 and 9 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Desphandey as applied to claim 1, and further in view of Doi and Moslehi et al. (*id.*, page 5); and claim 21 stands rejected under 35 U.S.C.

§ 103(a) as being unpatentable over Desphandey as applied to claim 1, and further in view of Schrank (*id.*, pages 5-6).[1]

Rather than reiterate the respective positions advanced by the examiner and appellants, we refer to the answer and to the brief and reply brief for a complete exposition thereof.

Claim 1 illustrates appellants' invention of a film forming method, and is representative of the claims on appeal:

1. A film forming method in which a reaction gas is brought into contact with a heated catalyzer and an electric field of not higher than a glow discharge starting voltage is caused to act on the produced reactive species, thereby providing kinetic energy and carrying out vapor growth of a predetermined film on a base.

We interpret the claim language of appealed claim 1 by giving the terms their broadest reasonable interpretation in light of the written description in appellants' specification, including the drawings, as interpreted by one of ordinary skill in the art, without reading into the claim any limitation or particular embodiment disclosed in the specification. *See, e.g., In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); *In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989). Thus, the claim terms must be given their ordinary meaning unless another meaning is intended by appellant as established in the written description of the specification. *See, e.g., Morris*, 127 F.3d at 1054-55, 44 USPQ2d at 1027; *Zletz*, 893 F.2d at 321-22, 13 USPQ2d at 1322. We determine that the plain language of claim 1 specifies a method of forming any film wherein any reaction gas is brought into contact with any manner of heated catalyzer to form a reactive species which is then provided with kinetic energy by an electric field of not higher than a glow discharge starting voltage to cause vapor growth of the film on a base substrate.

The principal issue in this appeal entails the interpretation of the language "an electric field of not higher than a glow discharge starting voltage." The written description in the specification contains the disclosure "an electric field of not higher than a glow discharge starting voltage, that is, an electric field of not higher than a plasma generation voltage in accordance with Paschen's

[1] We consider the brief filed April 15, 2004. Claims 1, 2, 8, 9, 14, 16, 17, 20 and 21 are before us on appeal and are set forth in the appendix to the brief. Claims 3 through 7, 10 through 13, 15, 18, 19, and 22 through 45 are also pending and have been withdrawn from consideration by the examiner under 37 CFR § 1.142(b).

law" (page 5, ll. 11-13, see also page 10, ll. 5-7). We find that the common, dictionary definition of "glow discharge" is "[a] discharge of electricity through gas at a relatively low pressure in an electron tube, characterized by several regions of diffuse, luminous glow and a voltage drop in the vicinity of the cathode that is much higher than the ionization voltage of the gas," and that "Paschen's Law" can be stated as "the sparking potential between two parallel plate electrodes in a gas is a function of the product of the gas density and the distance between the electrodes."[2]

We determine that the subject claim language considered in light of the meaning in the disclosure in the specification taken with the common, dictionary meaning of certain terms, is functional language which specifies that the electric field must be formed by a structure having two electrodes that is capable of generating a glow discharge, and thus a sparking potential therebetween with sufficient gas density. *See generally, In re Echerd*, 471 F.2d 632, 634-35, 176 USPQ 321, 322 (CCPA 1973); *In re Ludtke*, 441 F.2d 660, 663-64, 169 USPQ 563, 565-67 (CCPA 1971); *In re Swinehart*, 439 F.2d 210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971). Therefore, the upper limit of the voltage of the electronic field is not higher than that voltage which starts a glow discharge in a given apparatus having two electrodes capable of generating a glow discharge with sufficient gas density.

Appellants submit that the examiner's interpretation fails because the gases used by Desphandey to prepare diamond films are different than the gases disclosed in the specification for the preparation of silicon containing films (brief, page 9). The examiner finds that Desphandey would have disclosed that "[a] dc voltage of 80 volts may be used to accelerate electrons toward an anode, which directs the reactive species toward a base," and "interprets 80 volts to be below 'a glow discharge starting voltage', since the applicant has cited examples where a value of 500 volts is used and is below 'a glow discharge voltage' (page 44, line 8, of specification)" (answer, page 3; see also pages 7-8). The examiner further finds that Desphandey "teaches higher voltages may be used by using an RF plasma, indicating that the 80 volts is not of sufficient strength to be above the glow discharge voltage by comparison" (*id.*, pages 3-4; see also page 8). Appellants reply that the examiner's contention that 80 volts meets the claim limitation has not

[2] *See McGraw-Hill Dictionary of Scientific and Technical Terms* 857, 1454 (Sybil P. Parker, ed., New York, McGraw-Hill, Inc. 1994).

been supported by evidence (reply brief, pages 2-3).

We find that Desphandey would have disclosed to one of ordinary skill in this art that tungsten filament **46** "provides electrons for dissociating and ionizing" gases and carbon vapor, wherein the electrons "are accelerated" to metal plate anode **49** "to which a d.c. potential is applied," usually "in the range of about 80 volts," although higher voltage provided by an "R.F. plasma Therm d.c. power supply" may be used (col. 4, ll. 51-57, col. 5, ll. 43-54, and the single figure). Desphandey would have further disclosed that gas and carbon vapor activation "using a filament/anode geometry, where electrons emitted thermionically from a heated tungsten filament are accelerated towards a positively biased electrode" produce reactive species, thus providing the "ability to control plasma volume chemistry independent of the source and substrate reactions" (col. 3, ll. 26-62; see also col. 5, ll. 17-24).

It is well settled that in order for the examiner to establish a *prima facie* case of anticipation, each and every element of the claimed invention, arranged as required by the claim, must be found in a single prior art reference, either expressly or under the principles of inherency, in a manner sufficient to have placed a person of ordinary skill in the art in possession thereof. *See generally, In re Schreiber*, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997); *In re Spada*, 911 F.2d 705, 708, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990); *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 675, 677-78, 7 USPQ 1315, 1317 (Fed. Cir. 1988); *Lindemann Maschinenfabrik GMBH v. American Hoist and Derrick*, 730 F.2d 1452, 1458, 221 USPQ 481, 485 (Fed. Cir. 1984). Whether the teachings and inferences that one skilled in this art would have found in the disclosure of an applied reference would have placed this person in possession of the claimed invention, taking into account this person's own knowledge of the particular art, is a question of fact. *See generally, In re Graves*, 69 F.3d 1147, 1152, 36 USPQ2d 1697, 1701 (Fed. Cir. 1995), and cases cited therein (a reference anticipates the claimed method if the step that is not disclosed therein "is within the knowledge of the skilled artisan."); *In re Preda*, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968) ("[I]n considering the disclosure of a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom.").

On this record, we agree with appellants. We fail to find in Desphandey any evidence establishing that one skilled in this art would recognize that the tungsten filament which emits electrons thermionically and a metal plate anode in fact constitutes a structure capable of generating a glow discharge between two electrodes given sufficient gas density, and thus, that the applied d.c. potential of 80 volts between these two structures is in fact at or below a glow discharge starting voltage specified in claim 1. The examiner has not supplied additional evidence or scientific explanation supporting his position. Indeed, we find no established correlation between the glow discharge starting voltage disclosed with respect to the apparatus of, e.g., specification **FIG. 3** which contains two plate electrodes, and the gases used therein as disclosed in the specification and the d.c. voltage applied in the apparatus of Desphandey as relied on by the examiner.

Therefore, we find that the examiner has failed to establish a *prima facie* case of anticipation in the record before us, and accordingly, we reverse the ground of rejection of claims 1, 2, 16, 17 and 20 under § 102(b). *See generally, Spada*, 911 F.2d 705, 707 n.3, 15 USPQ2d 1655, 1657 n.3.

The absence of evidence that Desphandey in fact meets the limitations of appealed claim 1 also undermines the factual foundation for the examiner's *prima facie* case of obviousness in each of the three remaining grounds of rejection. Accordingly, we reverse the grounds of rejection of claims 8, 9, 14 and 21 under § 103(a). *See generally, In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984);

The examiner's decision is reversed.

Reversed

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Administrative Patent Judge)
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